CBRN PAPR Battery Requirements Summary

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CBRN PAPR
Battery Requirements Summary

Background

- Several manufacturers list capabilities of batteries within the stated requirements
- Numerous manufacturers using batteries list their equipment being able to comply with all testing associated with PAPR concept
- Similarity to the CBRN SCBA and the Industrial PAPR

CBRN PAPR
Battery Requirements Summary

Requirements

- Tested to operational battery life plus 20 minutes
  - –Under similar conditions to silica dust loading
  - –Under worst case conditions, i.e., loaded to level just prior to low flow indication
  - –Under battery performance testing, base on maximum total draw of PAPR
- Develop a resistance curve from silica dust or equivalent and apply the resistances associated over the operational battery life

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Battery Requirements Summary

Requirements Continued

- 15 minute operational battery life remaining warning must be apparent and allow for an additional fifteen minutes at desired flow
- 15 minute warning will be tested during operational battery life testing or in a similar method after operational battery life is completed
- Capable of demonstrating operational service life and/or battery expiration date

CBRN PAPR
Battery Requirements Summary

Requirements Continued

Non-Rechargeable battery

- Indicators may be active (alerts user when 15 min. warning is reached) or passive (alerts user until 15 min. warning is reached)
- Expiration date must be visible
- Must have a 15 minute operational battery life remaining warning

CBRN PAPR
Battery Requirements Summary

Requirements Continued

Rechargeable battery

- Indicators may be active or passive
- End of cycle life (number of recharges) must be noted
- Must have 15 minute operational battery life remaining warning

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Battery Requirements Summary

- User Instructions must list all applicable battery information
- Remaining operational battery life must be sufficient to sustain desired flow rate
- Methods of warning shall be specified by manufacturer

CBRN PAPR
Battery Requirements Summary

Requirements Continued

- Low flow indicator will be tested using the same mechanism that tests the operational battery life if operational battery life is tested via a loading scenario
- Can be passive or active
- Can be flow or pressure based
- Must be fully explained in user instructions

CBRN PAPR
Battery Requirements Summary

Shortfalls – Particulate Loading Equivalent

- Evaluate resistance changes during current particulate filter testing
- Develop method to add the resistance changes over the operational battery life
- Ensure that the method has appropriate flexibility to incorporate new technologies and designs
- Potentially very time consuming test procedures

CBRN PAPR Battery Requirements Summary

Shortfalls – Battery Load Test

- Develop method to determine full load (current draw) of system for all potential PAPR designs
- Ensure that the method has appropriate flexibility to incorporate new technologies and designs
- Evaluate reducing test time dramatically over total operational battery life time
- Time required for test equipment ordering and validation testing

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Battery Requirements Summary

Timeline – Particulate equivalent

- Analysis of resistance curve associated with particulate testing completed June 04
- Test method to apply previous completed July 04
- Verification testing completed Aug-Sept 04

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Timeline – Battery performance test

- Analysis of current draw determination procedures completed May-June 04
- Test method to apply previous completed July 04
- Equipment ordered and delivered August-September 04
- Verification testing completed September-October 04